REMARKS

The Office Action mailed August 12, 2004, has been carefully reviewed and Applicant notes with appreciation the identification of allowable subject matter.

By this Amendment, Applicant has canceled claims 11, 12, 27 and 28, amended claims 1-10, 15, 17-26 and 31, and added claims 33-36. Claims 1-10, 13-26 and 29-36 are pending in the application. Claims 1, 10, 15, 17, 26 and 31 are independent.

The Examiner objected to claims 10 and 26 as containing informalities which Applicant has corrected herein.

The Examiner rejected claims 1-15, 17-27 and 29-32 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-14 of U.S. Patent No. 6,205,184 to Al-Eidan ("the Al-Eidan patent"). The Examiner also rejected claims 16 and 32 under 35 U.S.C. 103(a) as being unpatentable over the Al-Eidan patent in view of U.S. Patent No. 5,200,835 to Sakamoto. The Examiner objected to claim 28 as being dependent on a rejected base claim but stated that claim 28 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As clarified in amended claims 1, 15, 17 and 31 presented herein, the present invention is directed to a method and transmitter for communicating via a communication channel. The method includes frequency modulating an information signal with a modulation index M that is not greater than 0.2 to compress the bandwidth of an information signal to form a narrow band or very narrow band frequency-modulated information signal having a

small or very small carrier frequency deviation at the transmitting side of a narrow or very narrow band communication channel and in the communication channel. Upper and lower significant sidebands of the narrow band or very narrow band frequency-modulated information signal are suppressed, and the narrow band or very narrow band frequency-modulated information signal without the upper and lower significant sidebands is transmitted such that the transmitted information signal obtains the total power of the transmitter and includes only the instantaneous frequency varied about the carrier frequency. This is not obvious in view of the Al-Eidan patent but instead is patentable thereover.

Figure 3A of the present invention depicts the output of a narrow band or very narrow band FM/PM transmitted signal as output by the modulator 120 of Figures 1A and 2. This output from modulator 120 corresponds to the output of the corresponding modulator 120 as implemented in the Al-Eidan patent.

Figure 3B of the present invention depicts the output of the bandpass filter 135 of Figures 1A, 1B and 2. As shown in Figure 3B, the bandpass filter 135 suppresses the significant upper and lower sidebands of the narrowband/very narrowband FM/PM modulated signal. All of the transmitted power is thus applied to the transmitted information signal which includes only the instantaneous frequency varied about the carrier frequency such that the maximum bandwidth is only 40% of the modulating frequency. This is not shown or suggested in the Al-Eidan patent. Instead, in the Al-Eidan patent, there are six sidebands such that the bandwidth is

600% of the modulating frequency and the transmitted power is distributed between the information signal and the six sidebands.

In sum, according to the present invention a modulation index of not more than 0.2 is selected to form a frequency/phase modulated signal having two significant sidebands to avoid any distortion to the transmitted signal, the higher order sidebands being generated due to distorted carrier frequency caused by the modulating signal. The two sidebands are suppressed by modulating the information signal with the small modulation index (0.2) to generate a narrowband FM or PM information signal having a small frequency deviation at the transmitting side of the narrow band communication channel. As a result, only the instantaneous frequency varied about the carrier frequency (the center frequency) is transmitted. Where the number of times per second that the instantaneous frequency varies about the carrier frequency is the modulating frequency, the amount of frequency deviation is proportional to the amplitude of the modulating signal. Thus, the modulating frequency components are contained in the FM/PM wave regardless of the modulation index.

For at least the foregoing reasons, claims 1, 15, 17 and 31 are patentable over the Al-Eidan patent. Favorable reconsideration and allowance thereof is requested. Claims 2-9, 16, 18-25 and 32, as well as new claims 33-36 are also in condition for allowance as claims properly dependent on an allowable base claim. New claims 33-36 are supported in the specification at page 4, lines 3-13.

Claim 26 has been amended to include the limitations of claims 27 and 28, previously dependent thereon and, in accordance with the Examiner's identification of allowable subject matter in claim 28, claim 26 is in condition for allowance. Claims 29 and 30 are also in condition for allowance as claims properly dependent on an allowable base claim. Claim 10 as amended herein is also presented as being in condition for allowance for at least the same reasons as claim 26, along with claims 13 and 14 dependent thereon.

With the foregoing amendments and remarks, the application is in condition for allowance. Should the Examiner have any questions or comments, the Examiner is cordially invited to telephone the undersigned attorney so that the present application can receive an early Notice of Allowance.

Respectfully submitted,

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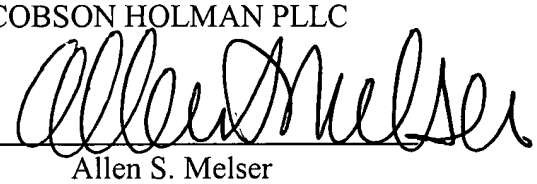
By 

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